AMENDMENTS TO THE CLAIMS

Please amend Claims 7, 8 and 16 as indicated below.

A complete listing of all claims is presented below with insertions underlined (e.g., insertion), and deletions struckthrough or in double brackets (e.g., ~~deletion~~ or [[deletion]]).

1. (Previously Presented) A detection system for use during irradiation of an interaction region of a structure with laser light, the structure comprising embedded material, the detection system comprising:

an optical system adapted to drill a hole having a depth in a portion of the structure by irradiating the interaction region with the laser light, thereby exposing a portion of the embedded material;

a collimating lens positioned to receive light emitted from the interaction region during drilling;

an optical fiber optically coupled to the collimating lens to receive light from the collimating lens; and

a spectrometer optically coupled to the optical fiber to receive light from the optical fiber, the spectrometer adapted for analysis of the light for indications of the embedded material within the interaction region, the spectrometer comprising:

an input slit adapted to receive light from the optical fiber, the input slit having a width selected to provide sufficient light transmittance and sufficient resolution;

an optical grating adapted to receive light from the input slit and to separate the light into a spectrum of wavelengths;

a collection lens adapted to receive a selected range of wavelengths of the separated light from the optical grating; and

a light sensor adapted to receive the selected range of wavelengths and to generate a signal corresponding to an intensity of the received light, wherein the detection system is responsive to the signal by avoiding damage to the irradiated embedded material.

2. (Original) The detection system of Claim 1, wherein the structure comprises concrete and the embedded material comprises rebar.

3. (Original) The detection system of Claim 1, wherein the width of the input slit is in a range between approximately 5 microns and approximately 200 microns.

4. (Original) The detection system of Claim 1, wherein the height of the input slit is approximately 1 millimeter.

5. (Original) The detection system of Claim 1, wherein the light sensor comprises a coupled-capacitance discharge camera system.

6. (Original) The detection system of Claim 1, further comprising at least one neutral density filter adapted to reduce the light received by the spectrometer.

7. (Currently Amended) The detection system of Claim 1, wherein the ~~collection~~ collimating lens is coaxial with the laser light impinging on the interaction region.

8. (Currently Amended) The detection system of Claim 1, wherein the ~~collection~~ collimating lens is off-axis with the laser light impinging on the interaction region.

9. (Original) The detection system of Claim 1, wherein the structure comprises concrete and the embedded material comprises rebar, and the detection system is adapted to analyze light in a spectral region having an upper cutoff wavelength of approximately 582 nanometers and a lower cutoff wavelength of approximately 600 nanometers.

10. (Original) The detection system of Claim 9, wherein the detection system is further adapted to analyze the spectral region by calculating a spectral ratio.

11. (Original) The detection system of Claim 10, wherein the spectral ratio being greater than or equal to one corresponds to rebar within the interaction region.

12. (Original) The detection system of Claim 1, wherein the detection system further comprises a computer system adapted to analyze spectroscopic data.

13. (Original) The detection system of Claim 12, wherein the computer system comprises a microprocessor, a memory subsystem, and a display.

14. (Original) The detection system of Claim 13, wherein the microprocessor and the memory subsystem are mounted in an enclosure.

15. (Previously Presented) A detection system for use during irradiation of an interaction region of a structure with laser light, the structure comprising embedded material, the detection system comprising:

means for drilling a hole in the structure, thereby exposing previously-unexposed embedded material within the interaction region;

means for collecting light emitted from the interaction region during drilling;

means for separating the collected light into a spectrum of wavelengths; and

means for analyzing at least a portion of the spectrum and producing a signal indicative of the exposed embedded material within the interaction region, wherein the drilling means is adapted to avoid damaging the irradiated embedded material upon receiving the signal from the analyzing means.

16. (Currently Amended) A method of detecting an embedded object within a laser-irradiated interaction region of a structure comprising the embedded object, the method comprising:

drilling a hole in the structure, thereby exposing the embedded object within the interaction region;

collecting light from the interaction region during drilling;

separating the collected light into a spectrum of wavelengths; ~~and~~

analyzing at least a portion of the spectrum for indications of the exposed embedded object within the interaction region; and

selectively adjusting the drilling in response to the indications, thereby avoiding substantially damaging the reinforcing member.

17. (Previously Presented) The method of Claim 16, wherein the embedded object comprises a reinforcing member.

18. (Previously Presented) The method of Claim 17, wherein the reinforcing member comprises rebar.

19. (Previously Presented) A method of detecting an embedded material within a laser-irradiated interaction region of a structure comprising the embedded material, the method comprising:

drilling a hole in the structure, thereby exposing the embedded material within the interaction region;

collecting light from the interaction region during drilling;

separating the collected light into a spectrum of wavelengths;

analyzing at least a portion of the spectrum for indications of the embedded material within the interaction region; and

avoiding irradiation of the interaction region when the indications of the embedded material are detected.

20. (Previously Presented) The method of Claim 19, wherein the embedded material comprises a reinforcing member.

21. (Previously Presented) The method of Claim 20, wherein the reinforcing member comprises rebar.